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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte NICHOLAS L. ABBOTT, MATTHEW L. TINGEY,
BRIAN H. CLARE, and CHANG-HYUN JANG

Appeal 2009-013739
Application 10/711,517
Technology Center 1600

Decided: January 19, 2010

Before DONALD E. ADAMS, RICHARD M. LEBOVITZ, and
JEFFREY N. FREDMAN, *Administrative Patent Judges*.

ADAMS, *Administrative Patent Judge*.

DECISION ON APPEAL

This appeal under 35 U.S.C. § 134 involves claims 1-6, 10, 11, and 14-23. Claims 24-41, the only remaining claims, have been withdrawn from consideration (App. Br. 2). We have jurisdiction under 35 U.S.C. § 6(b).

STATEMENT OF THE CASE

The claims are directed to a method for detecting a ligand in a sample.

Claim 1 is illustrative:

1. A method for detecting a ligand in a sample comprising:
 - (a) contacting a sample having a ligand with an affinity substrate, wherein the affinity substrate comprises a receptor capable of specifically binding said ligand, the receptor binding the ligand upon contact with the sample;
 - (b) contacting the affinity substrate with a detection surface, wherein the ligand which is bound to the receptor is transferred to the detection surface; and
 - (c) detecting the presence of the ligand on the detection surface by contacting the detection surface with a liquid crystal, wherein the presence of the ligand on the detection surface is detected by a change in the orientation of the liquid crystal contacted with the detection surface.

The Examiner relies on the following evidence:

Tang et al.	US 5,886,195	Mar. 23, 1999
Abbott et al.	US 6,284,197 B1	Sep. 4, 2001
Choi et al.	US 6,292,296 B1	Sep. 18, 2001

Bernard et al., *Affinity capture of proteins from solution and their dissociation by contact printing*, 19 NATURE BIOTECHNOLOGY 866-869 (2001).

Renault, et al. (Renault I), *Fabricating Microarrays of Functional Proteins Using Affinity Contact Printing*, 41 ANGEW. CHEM. INT. ED. 2320-2323 (2002).

Renault, et al. (Renault II), *Fabricating Microarrays of Functional Proteins Using Affinity Contact Printing*, WILEY-VCH Verlag GmbH, Supporting Information for Angew. Chem. Int. Ed. Z18619 (2002), obtained from <http://www.angewandte.org> on March 21, 2007.

Appellants rely on the following evidence:

Nicholas L. Abbott Declaration, executed October 9, 2007 (the “Abbott Declaration”).

The rejections presented by the Examiner follow:

1. Claims 1-6, 10, 11, 15-20, 22, and 23 stand rejected under 35 U.S.C. § 112, second paragraph.
2. Claims 1-6, 10, 11, 15-20, 22, and 23 stand rejected under 35 U.S.C § 103(a) as unpatentable over Bernard or Renault¹ in combination with Abbott.
3. Claim 14 stands rejected under 35 U.S.C § 103(a) as unpatentable over Bernard or Renault in combination with Abbott and Tang.
4. Claims 21 stands rejected under 35 U.S.C § 103(a) as unpatentable over Bernard or Renault in combination with Abbott and Choi.
5. Claims 1-6, 10, 11, and 14-23 stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 18-23 of copending Application No. 11/542,432 in view of Renault.
6. Claims 1-6, 10, 11, and 14-23 stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 18-23 of copending Application No. 11/418,755 in view of Renault.

We reverse the rejection under 35 U.S.C. § 112, second paragraph and the provisional rejection under the judicially created doctrine of

¹ The Examiner collectively refers to Renault I and Renault II as “Renault” (*see* Ans. 6). We do the same.

obviousness-type double patenting as being unpatentable over claims 18-23 of copending Application No. 11/418,755 in view of or Renault.

We affirm all other grounds for rejection.

Definiteness:

ISSUE

Have Appellants established error in the Examiner's conclusion that the claims are indefinite because it is unclear how a *change* in the orientation of the liquid crystal would be assessed in the context of the claimed invention?

FINDINGS OF FACT

FF 1. The Examiner finds that Appellants claims read

[O]n methods in which the ligand is applied to the detection surface first and then the liquid crystal is subsequently applied to the surface. In this case, it is not clear what the change in orientation would be assessed relative to, since the liquid crystal would not yet be oriented or anchored on the surface before ligand binding.

(Ans. 5.)

FF 2. Appellants' Specification² discloses that

The presence or absence of any ligand transferred to the detection surface can . . . be visualized using a liquid crystal. Typically, the liquid crystal is placed on the detection surface after it has been contacted with the affinity substrate and the liquid crystal is visualized. . . . A disordering or disruption of the liquid crystal typically indicates that ligand is present on the

² Our reference to Appellants' Specification is to the Specification having Pub. Number 2005/0079486 A1.

detection surface. . . . [T]he presence of the ligand on the capture surface will be reported by the liquid crystal assuming a well-defined orientation that is distinguishable from the orientation assumed by the liquid crystal in the absence of the ligand.

(Spec. ¶ [0055].)

PRINCIPLES OF LAW

Claim language must be analyzed “not in a vacuum, but always in light of the teachings of the prior art and of the particular application disclosure as it would be interpreted by one possessing the ordinary level of skill in the pertinent art.” *In re Moore*, 439 F.2d 1232, 1235 (CCPA 1971).

“The test for definiteness is whether one skilled in the art would understand the bounds of the claim when read in light of the specification.” *Miles Laboratories, Inc. v. Shandon, Inc.*, 997 F.2d 870, 875 (Fed. Cir. 1993).

Claims are in compliance with 35 U.S.C. § 112, second paragraph, if “the claims, read in light of the specification, reasonably apprise those skilled in the art and are as precise as the subject matter permits.” *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1385 (Fed. Cir. 1986).

Although “it is entirely proper to use the specification to interpret what the patentee meant by a word or phrase in the claim, ... this is not to be confused with adding an extraneous limitation appearing in the specification, which is improper. By ‘extraneous,’ we mean a limitation read into a claim from the specification wholly apart from any need to interpret ... particular words or phrases in the claim.” *E.I. du Pont de Nemours & Co. v. Phillips Petroleum Co.*, 849 F.2d 1430,

1433, 7 USPQ2d 1129, 1131 (Fed.Cir.), *cert. denied*, 488 U.S. 986, 109 S.Ct. 542, 102 L.Ed.2d 572 (1988).

In re Paulsen, 30 F.3d 1475, 1480 (Fed. Cir. 1994).

ANALYSIS

Appellants contend that when read in light of their Specification, a “‘change in orientation’ clearly means that the orientation of the liquid crystal in contact with the detection surface varies between areas of the detection surface containing bound ligand and areas of detection surface that do not contain bound ligand” (App. Br. 4; *see also* FF 2).

The Examiner asserts, however, that limitations from the Specification will not be read into the claims (Ans. 18). Therefore, the Examiner asserts that since the claims do not recite a limitation regarding the change in orientation of the liquid crystal “*relative to or as compared to* the orientation of liquid crystal in contact with regions of the same detection surface that do not contain ligand” the claims are indefinite (*id.*). In addition, the Examiner asserts that “other plausible constructions of the ‘change in orientation’ are possible. For example, this claim language could also refer to the orientation of the liquid crystals prior to their application onto the detection surface vs. their orientation after being applied to the detection surface” (Ans. 19).

Appellants have the better argument. While we recognize the Examiner’s reliance on *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993), to find that “although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims” (Ans. 18), we are not persuaded that *Van Geuns* supports the Examiner’s conclusion that the claims are indefinite. In this case we are not looking to

the Specification to add an extraneous limitation to the claim; instead, we look to the Specification to ascertain the meaning of the claim term as it is used by the inventor in the context of the entirety of his invention (*see, e.g.*, App. Br. 4). “[I]t is entirely proper to use the specification to interpret what the patentee meant by a word or phrase in the claim.” *In re Paulsen*, 30 F.3d at 1480.

Because we read the claims in light of Appellants’ Specification, we disagree with the Examiner’s assertion that “other plausible constructions of the [phrase] ‘change in orientation’” may render the claim indefinite (Ans. 19). The claim clearly specifies that the “presence of ligand” is detected by the “change in the orientation of the liquid crystal.”

CONCLUSION OF LAW

Appellants have established error in the Examiner’s conclusion that the claims are indefinite because it is unclear how a *change* in the orientation of the liquid crystal would be assessed in the context of the claimed invention.

The rejection of claims 1-6, 10, 11, 15-20, 22, and 23 under 35 U.S.C. § 112, second paragraph is reversed.

Obviousness:

ISSUE

Have Appellants established error in the Examiner’s prima facie case of obviousness?

FINDINGS OF FACT

FF 3. Appellants do not dispute and therefore concede to the Examiner's finding that Bernard and Renault teach a method for detecting a ligand that comprises the steps of (a) contacting a sample that contains a ligand with an affinity substrate that comprises receptors capable of specifically binding the ligand; (b) contacting the affinity substrate with a detection surface, to transfer at least a portion of the ligand bound to the receptor to the detection surface; and then (c) detecting the ligands on the detection surface using radioactive or fluorescent labels as taught by Bernard or fluorescent- or gold-labeled antibodies as taught by Renault (Ans. 6-8; *Cf.* Appellants' claim 1, parts (a) and (b)).

FF 4. Bernard and Renault differ from the claimed invention by failing to teach the detection "of the ligand by contacting the detection surface with a liquid crystal, wherein a change in the orientation of the liquid crystal indicates the presence of a ligand" (Ans. 7 and 8; *Cf.* Appellants' claim 1, part (c)).

FF 5. Abbott teaches the use of a liquid crystal to detect ligand bound to the surface of a substrate (Ans. 8). Specifically, Abbott teaches that "[t]o perform liquid crystal detection, the ligand is bound to the surface of the substrate, liquid crystal is contacted with the substrate in the form of a mesogenic layer, and the orientation of the liquid crystal is assessed" (*id.*).

FF 6. Abbott teaches that "[t]he liquid crystal (mesogens) undergo a detectable switch in orientation upon interaction of the ligand with the surface, allowing for the ligand to be detected" (Ans. 9).

FF 7. Abbott teaches "that liquid crystal detection obviates the need for prelabeling of ligand, such as with a radiolabel or a fluorescent moiety" (*id.*).

FF 8. Abbott teaches microcontact printing to pattern a substrate on a substrate (Ans. 20). Bernard and Renault each use “a type of microcontact printing (‘affinity’ microcontact printing) to stamp ligand onto a surface” (Ans. 21).

FF 9. The Examiner recognizes that Abbott “does not teach *affinity* microcontact printing, the type of microcontact printing taught by Bernard et al. and Renault et al.” (Ans. 22.)

FF 10. The Abbott Declaration addresses U.S. Patent No. 6,852,285 B2, which is not relied upon by the Examiner (*Cf.* Abbott Dec. 2: ¶ 5 and Ans. 20: n. 1). Nevertheless, the Examiner finds that since the ‘285 patent is a continuation of the Abbott patent relied upon on this record, the statements made in the Abbott Declaration “are equally applicable to the pending rejection as the disclosures of the two patents are the same” (Ans. 20: n. 1).

FF 11. The Abbott Declaration states that the Abbott reference teaches the use of microcontact printing to “fabricate surfaces (referred to as ‘substrates’ in the patent) on which molecular interactions can be detected using liquid crystals” and as such it is “a tool for microfabrication of structured surfaces” (Abbott Dec. 2: ¶ 6).

FF 12. The Abbott Declaration states that microcontact printing as disclosed in the Abbott reference cannot “be used to deliver analytes to a surface for detection of molecular interactions using liquid crystal” (Abbott Dec. 3: ¶ 6).

FF 13. The Abbott Declaration states that in contrast to the Abbott reference’s disclosure of microcontact printing, “[i]t is th[e] use of ‘affinity’ microcontact printing (i.e., a means of delivery of an analyte to a surface) that is described and claimed in my present patent application” (*id.*).

FF 14. The Examiner finds that Bernard and Renault teach “glass or polystyrene detection surfaces” and Abbott teaches “that glass and polystyrene are both suitable substrates compatible with liquid crystal detection” (Ans. 26).

PRINCIPLES OF LAW

“[T]he [E]xaminer bears the initial burden, on review of the prior art or on any other ground, of presenting a *prima facie* case of unpatentability.” *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992). On appeal to this Board, Appellants must show that the Examiner has not sustained the required burden. *See Ex parte Yamaguchi*, 88 USPQ2d 1606, 1608 and 1614 (BPAI 2008) (precedential); *Ex parte Fu*, 89 USPQ2d 1115, 1118 and 1123 (BPAI 2008) (precedential).

“The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007). It is proper to “take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *Id.* at 418. *See also id.* at 421 (“A person of ordinary skill is also a person of ordinary creativity, not an automaton.”). In sum, the “suggestion test is in actuality quite flexible and not only permits, but *requires*, consideration of common knowledge and common sense.” *DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1367 (Fed. Cir. 2006).

“[W]hen a *prima facie* case is made, the burden shifts to the applicant to come forward with evidence and/or argument supporting patentability.” *In re Glaug*, 283 F.3d 1335, 1338 (Fed.Cir.2002). Rebuttal evidence is “merely a showing of

facts supporting the opposite conclusion.” *In re Piasecki*, 745 F.2d 1468, 1472 (Fed.Cir.1984). . . . When a patent applicant puts forth rebuttal evidence, the Board must consider that evidence. *See In re Soni*, 54 F.3d 746, 750 (Fed.Cir.1995) (stating that “all evidence of nonobviousness must be considered when assessing patentability”); *In re Sernaker*, 702 F.2d 989, 996 (Fed.Cir.1983) (“If, however, a patent applicant presents evidence relating to these secondary considerations, the board must always consider such evidence in connection with the determination of obviousness.”).

In re Sullivan, 498 F.3d 1345, 1351 (Fed. Cir. 2007). “When prima facie obviousness is established and evidence is submitted in rebuttal, the decision-maker must start over.” *In re Rinehart*, 531 F.2d 1048, 1052 (CCPA 1976); *In re Hedges*, 783 F.2d 1038, 1039 (Fed. Cir. 1986) (“If a prima facie case is made in the first instance, and if the applicant comes forward with reasonable rebuttal, whether buttressed by experiment, prior art references, or argument, the entire merits of the matter are to be reweighed”).

Arguments not made are waived. *See* 37 C.F.R. § 41.37(c)(1)(vii).

ANALYSIS

Bernard or Renault, in combination with Abbott:

The claims have not been argued separately and therefore stand or fall together. 37 C.F.R. § 41.37(c)(1)(vii). Claim 1 is representative.

Based on the foregoing findings of fact, the Examiner concludes that “it would have been obvious to one of ordinary skill in the art to employ liquid crystal detection as taught by Abbott et al. in place of fluorescent, gold, or radioactive labeling-based detection as the means of detecting the ligand in the methods of Bernard et al. or Renault et al” (Ans. 9).

The Examiner concedes that Abbott does not teach affinity microcontact printing (FF 9). Nevertheless, Appellants rely on the Abbott Declaration to support the contention that the affinity microcontact printing taught by Bernard and Renault “is substantially different than the microcontact printing methods disclosed by Abbott” (App. Br. 8; *see also* FF 11-13). From this Appellants contend that since Abbott’s microcontact printing is different from and not “readily substitutable” with the affinity microcontact printing taught by Bernard and Renault “the Office’s assumption supporting a reasonable expectation of success in combining the elements of the cited documents to make the presently claimed invention is clear error” (App. Br. 8). We are not persuaded.

The Examiner’s *prima facie* case relies upon the use of the affinity microcontact printing methodology taught by either Bernard or Renault to transfer ligand to a detection surface as required by parts (a) and (b) of Appellants’ claim 1 (FF 3). Appellants do not dispute and therefore concede to the Examiner’s factual findings on this point (*id.*). The Examiner relied upon Abbott to teach that liquid crystal detection can be substituted for detection methods using radioactive, fluorescent, or fluorescent-/gold-labeled antibodies as taught by Bernard and Renault to detect ligand on a detection surface (*id.*). Accordingly, Appellants’ contentions regarding the substitution of Abbotts microcontact printing methodology for the affinity microcontact printing methodology taught by Bernard and Renault is off point and not persuasive.

We disagree with Appellants’ contention that the Examiner dismissed the statements made in the Abbott Declaration (App. Br. 8-9). Instead, we find that the Examiner did consider the Abbott Declaration and found the

statements made therein to be unpersuasive as they relate to the rejection of record (*see e.g.*, Ans. 23 (“Because the determination of obviousness does not contend or rely on the position Appellant[s] argue[] against, the Declaration evidence attempting to rebut such a position is not persuasive to outweigh the evidence of obviousness”)).

Appellants contend that Abbott’s “teaching regarding microcontact printing was in the context of fabricating detection surfaces, a pre-detection activity. In contrast, the presently claimed invention is directed to using a specific type of microcontact printing, namely affinity microcontact printing to carry out delivery of a ligand to be analyzed by a detection surface” (App. Br. 11). Appellants further contend that since the detection of a ligand on a surface by “liquid crystal, as opposed to ligand detection by fluorescent or radioactive labeling . . . work on completely different principles and have completely different uses” it “is far from a mere substitution of one known element for another to obtain predictable results” (App. Br. 10). In this regard, Appellants contend that Bernard and Renault do not teach the combination of “affinity microcontact printing with liquid crystal detection” and Abbott does not teach a “method of detecting affinity microcontact printed ligands via detection surfaces compatible with liquid crystals” (*id.*). We are not persuaded.

As discussed above, the evidence on this record supports a conclusion that Bernard and Renault teach the delivery of a ligand to be analyzed to a detection surface as required by parts (a) and (b) of Appellants’ claim 1. The Examiner finds that Bernard and Renault teach “glass or polystyrene detection surfaces” and Abbott teaches “that glass and polystyrene are both

suitable substrates compatible with liquid crystal detection” (FF 14). From this the Examiner reasons that since

[T]he detection surfaces of Bernard et al. and Renault et al. are made of the same materials taught by Abbott et al. to be suitable, it is maintained that one of ordinary skill in the art would have had a reasonable expectation of success in employing the detection surfaces of Bernard et al. and Renault et al. with liquid crystal detection.

(Ans. 26.)

Therefore, the only consideration for a person of ordinary skill in the art is whether to use a radioactive/fluorescent detection system or liquid crystals (*Cf.* 3-5). Abbott teaches “that liquid crystal detection obviates the need for prelabeling of ligand, such as with a radiolabel or a fluorescent moiety” (FF 7). Thus, Abbott suggests that liquid crystal detection method offers an advantage over use of radioactive/fluorescent detection systems. Accordingly, we are not persuaded by Appellants’ contention that “the substitution of the detection methods described in the Abbott et al. reference for fluorescent or radioactive labeling as described by Renault et al. and Bernard et al. would not have been prompted by design incentives” (App. Br. 12). For the same reasons we are not persuaded by Appellants’ contention that the rejection of record “is based on impermissible hindsight analysis using the Appellant’s [sic] disclosure” (*id.*). Instead, we find substantial evidence on this record that supports the Examiner’s conclusion.

Bernard or Renault in combination with Abbott and Tang:

Appellants contend that Tang “fails to cure the deficiencies in Bernard et al., Renault et al., and Abbott et al., as discussed above” (App. Br. 13).

Having found no deficiency in the combination of Bernard or Renault in view of Abbott we are not persuaded by Appellants' contention.

Bernard or Renault in combination with Abbott and Choi:

Appellants contend that Choi "fails to cure the deficiencies in Bernard et al., Renault et al., and Abbott et al., as discussed above" (App. Br. 14).

Having found no deficiency in the combination of Bernard or Renault in view of Abbott we are not persuaded by Appellants' contention.

CONCLUSION OF LAW

Appellants failed to establish error in the Examiner's prima facie case of obviousness.

We affirm the rejection of claim 1 under 35 U.S.C § 103(a) as unpatentable over Bernard or Renault in combination with Abbott. Claims 2-6, 10, 11, 15-20, 22, and 23 fall together with claim 1.

We affirm the rejection of claim 14 under 35 U.S.C § 103(a) as unpatentable over Bernard or Renault in combination with Abbott and Tang.

We affirm the rejection of claim 21 under 35 U.S.C § 103(a) as unpatentable over Bernard or Renault in combination with Abbott and Choi.

Obviousness-type Double Patenting:

ISSUE

Have Appellants established error in the Examiner's provisional obviousness-type double patenting rejections.

FINDINGS OF FACT

FF 15. “Appellant’s [sic] Appeal Brief does not include the . . . provisional rejections in the listing of Grounds of Rejection to be Reviewed on Appeal, and Appellant[s] ha[ve] failed to argue the rejections” (Ans. 3).

FF 16. Patent Office records indicate that Application No. 11/418,755 was abandoned on April 13, 2009.

PRINCIPLES OF LAW

Arguments not made are waived. *See* 37 C.F.R. § 41.37(c)(1)(vii).

ANALYSIS

Appellants did not address and therefore concede to the Examiner’s provisional obviousness-type double patenting rejections (FF 15). Nevertheless, Application No. 11/418,755 was abandoned on April 13, 2009 (FF 16). Therefore, the obviousness-type double patenting rejection based on Application No. 11/418,755 is moot.

CONCLUSION OF LAW

Appellants failed to establish error in the Examiner’s provisional obviousness-type double patenting rejections. Therefore, the provisional rejection of claims 1-6, 10, 11, and 14-23 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 18-23 of copending Application No. 11/542,432 in view of Renault is affirmed.

Because Application No. 11/418,755 was abandoned on April 13, 2009 the provisional rejection of claims 1-6, 10, 11, and 14-23 under the

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judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 18-23 of copending Application No. 11/418,755 in view of Renault is reversed as moot.

TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

cdc

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